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ABSTRACT
The students in an introductory college psychology course were given the option of attending live lectures (control group) or listening to audio-taped lectures (experimental group). Each experimental subject was issued a tape recorder, a set of lecture tapes, and a schedule of lecture topics as presented to the control group. Conducted in the fall quarter and repeated in the spring, the experiment confirmed by means of an objective final examination that taped lectures can be as effective as traditional lecture presentation in supplying information to college undergraduates. (TI)

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The Feasibility of Using Taped Lectures to Replace Class Attendance*

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ABSTRACT

The present study was undertaken to evaluate the effectiveness of taped lectures as compared with traditional lectures in a college class. The students in an introductory psychology course were given the option of either attending live lectures or listening to taped lectures. Tapes and tape recorders were supplied for the study through the courtesy of the 3M Company. The experiment was conducted in the fall quarter and replicated in the spring quarter of the same year. In both replications the results were the same: the students who listened only to the taped lectures attained the same average course grade as did the students who attended the traditional lectures.

INTRODUCTION

For some time now tape recording equipment has been used in many phases of education. Much of the use of this equipment in the learning process has been supplementary in nature. A well known example is the use of tapes in language courses; in this use a library of tapes is available as a laboratory adjunct allowing the student to gain familiarity with the sound of the spoken language. Such use has been assumed to be very effective in the learning of language skills. Research on the use of tapes in language courses has shown there is still some question regarding the effectiveness of the language laboratories (Torkelson & Driscoll, 1968). As noted in the review by Torkelson and Driscoll (1968, p. 131) the research on language laboratory techniques often lacks a comparison among the various techniques presently in use.

Very few studies, however, have attempted to assess the effectiveness of teaching by tape recorded lecture. Popham (1961, 1962) used taped lectures in both graduate and undergraduate courses. In both these studies the students all listened to the same tape recorder at the same time and in the same room,

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much as in a normal class meeting. Following each recorded lecture the students engaged in discussion groups. Popham found no significant differences in achievement between these students and control groups who received the traditional "live" lecture presentation. A review of the literature since 1962 indicates that no further investigations have been made of the feasibility of using taped lectures.

As the pressures on instructors and on classroom facilities continue to increase, it becomes increasingly important to find ways to alleviate this pressure. Popham's studies indicate that students taught by taped lectures do as well as student taught by conventional lecture methods. The purpose of the present study is to go a step further by substituting the taped lecture on an individual basis for the whole classroom situation, and comparing that technique with the traditional lecture.

The course used in this study was an introductory psychology course at Iowa State University, a course which is taught every quarter. During the winter and spring quarters of 1967 the lectures were recorded and notes were taken on the blackboard material used by the instructor during the presentation of his lectures. Later the tapes were edited, cutting out purely topical references, and the blackboard notes were assembled into booklet form. The instructor whose lectures were recorded was also the lecturer for both replications of this experiment, and he made no basic changes in the presentation of his material. Thus, what the experimental Ss heard on tape was almost exactly what they would have heard had they attended live lectures.

The experiment was conducted during the fall quarter of 1967 and replicated in the spring quarter of 1968. No methodological changes were made between replications of the experiment. It was hypothesized that there would be no differences in achievement between the students who attended the lectures and those who used the tapes exclusively.

METHOD

Subjects

The experiment used one section of Psychology 101. The students who signed up for the section were allowed to choose between taking the course by traditional lecture and by taped lecture. In the fall, 149 chose tape

(experimental group), 211 chose live lecture (control group); in the spring 141 chose tape and 197 chose the traditional lecture method. By the end of the fall quarter, 35 control Ss and 2 experimental Ss had dropped the course. In the spring quarter, 23 control and 3 experimental Ss dropped the course.

Material

Each experimental S was issued a Wollensak 1500, supplied by the 3M Company of Minneapolis, a complete set of lecture tapes, a booklet containing the usual blackboard material, and a schedule of the lecture topics as they were to be presented to the control group.

Procedure

The experimental Ss agreed (1) not to attend the live lectures, (2) not to allow control Ss to listen to the tapes and (3) not to copy the tapes issued to them. Each experimental S was left entirely free to proceed at his own pace. He was, however, allowed to attend class sessions when supplementary movies were shown, and he was required to take the three exams given over the course material. All exams were of the objective, multiple-choice type. Thus, no distinction between control and experimental Ss could be made in grading.

RESULTS

The independent variable in this study was teaching method, i.e. taped lecture vs. traditional live lecture. Dependent variables used were scores on the regular exams, total class points (based on test scores and supplemented by serving as subjects in research experiments), and final grade attained.

Because of the unequal number of Ss in the two groups, and because of the possibility that the experimental Ss might differ systematically from the control Ss, the dependent variables were analyzed by covariance analysis using a regression technique. Information on three covariates was available for all Ss: high school rank (HSR), American College Testing composite scores (ACT), and Minnesota Scholastic Aptitude scores (MSAT). In addition, cumulative grade point (GPA) was available and utilized in the spring replication. As can be seen in Tables 1 and 2, the experimental and control groups are quite similar. Tables 1 and 2 give the mean values of the two groups on the variables involved. Tables 3 and 4 give the results of the analysis of variance on the mean grade attained in the two replications. In neither replication was there

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Insert tables about here
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a significant difference between the mean course grade attained by the two groups. Though the results are not displayed here, separate analyses were also made of the results of each of the class exams. In all cases the difference was insignificant, with the exception of the second exam in the spring quarter where the experimental group had a mean score of 32 out of 45 as compared to 30 for the control group. This difference is statistically significant at the .05 level.

A comparison of the experimental and control groups by HSR quartiles shows the lowest quartile experimental group to have significantly higher (beyond the .05 level) total scores. In the fall the lowest quartile experimental group had higher grades (but not at .05 level) and in the spring the lowest quartile experimental group again received higher grades (at the .05 level). At the other HSR quartiles the scores remained insignificantly different, or reversed from fall to spring quarters. From this we may infer that the taped lecture may have benefited the students in the lowest performance quartile more than the traditional lecture.

DISCUSSION

This study confirms and extends Popham's previous findings that taped lectures can be as effective as the traditional lecture presentation in supplying information to college undergraduates. It was predicted that students, given a recorder and a set of tapes, could and would learn as much about the course material as would the students who attended the regular lectures, and this in fact is what the results of the experiment show.

At the end of each of the two replications of the experiment, the experimental Ss were asked to fill out a brief questionnaire regarding their reaction to the use of taped lectures in lieu of regular class attendance. The reaction to the method was generally favorable. The Ss were unanimous in agreeing that the use of tapes results in their spending as much (65%), or more (35%) time on the course than they would have otherwise. 68% thought they had learned as much or more, 32% thought they had learned less. 70% said they would recommend Psychology 101 tape lectures to other students, 30% said

they would not. 52% said they would prefer other tape lecture presentations to large lecture sessions. Most of the Ss were appreciative of the freedom and flexibility which the method allowed them, though many of them admitted that procrastination frequently led to many hours of concentrated listening just prior to exams. 51% of the Ss reported listening to the tapes no more than once each.

One interesting feature of the experiment was the noticeable difference in the number (5) of those who dropped the experimental method as compared with the number (58) that dropped the regular method. A possible explanation of this fact is that students tend to drop a course if they have fallen behind in the work and see little hope of recouping, a situation which does not as readily occur if the material is always available on tape.

The experimental Ss in this study were all volunteers. Hence the study provides no information about the performance of students who would be offered no alternative in a given course to taking it via taped lectures. Neither does the study provide much information about what other types of courses might be amenable to this approach. In general, it would seem that lower level courses which are largely content-oriented could be handled in this way.

Table 3. Summary of covariance analysis with grade as dependent variable.

(Fall quarter N-324)

Source	df	SS	MS	F
regression	4	101.07		
covariates	3	(-) 100.68		
treatments	1	0.39	0.39	0.55
residual	319	223.03	0.70	
	323			

Table 4. Summary of covariance analysis with grade as dependent variable.

(Spring quarter N=312)

Source	df	SS	MS	F
regression	5	74.96		
covariates	4	(-)73.74		
treatments	1	1.22	1.22	2.77
residual	306	134.92	.44	
	311			

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Table 1. Fall Averages

	Control (N=181)		Exp (N=143)	
	M	SD	M	SD
HSR	23.10	15.67	21.30	16.41
ACT	24.99	3.43	25.64	2.88
MSAT	50.54	10.56	51.59	10.74
Psych. Grade	2.26	1.00	2.29	.99

Table 2. Spring Averages

	Control (N=174)		Exp (N=138)	
	M	SD	M	SD
HSR	21.17	13.41	20.57	13.07
ACT	25.62	9.37	26.10	2.99
MSAT	50.02	11.67	50.62	11.19
Psych. Grade	.96	.79	2.09	.85
GPA	2.27	.61	2.24	.61